UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/618,508	07/18/2000	Wayne A. Sawdon	POU9-2000-0112-US1	9751

7590 08/12/2003

Blanche E Schiller Esq
Heslin & Rothenberg PC
5 Columbia Circle
Albany, NY 12203

EXAMINER
ALAM, SHAHID AL

ART UNIT	PAPER NUMBER
2172	

DATE MAILED: 08/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/618,508	Applicant(s) SAWDON ET AL.	
	Examiner Shahid Al Alam	Art Unit 2172	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 May 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-71* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12,17-35,40-60 and 65-71* is/are rejected.

7)☒ Claim(s) *13-16,36-39 and 61-64* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

UNITED STATES DEPARTMENT OF COMMERCE
U.S. Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450

APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.

EXAMINER	
ART UNIT	PAPER
	7

DATE MAILED:

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner for Patents

Shahid Al Alam
Primary Examiner
Art Unit: 2172

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 29 May 2003 have been fully considered but they are not persuasive for the following reasons:

Applicants argue that there is no teaching or suggestion in Grimsrud of performing allocation by a plurality of file system; Grimsrud does not teach a plurality of file systems; Grimsrud does not teach obtaining one or more weights for one or more storage devices.

Applicants argue that Smith fails to teach performing allocation by a plurality of file system; Smith fails to teach one or more weights for one or more storage devices.

Applicants argue that Smith does not overcome the deficiencies of Grimsrud.

Examiner respectfully disagrees the entire allegation as argued. Examiner, in his previous office action, gave detail explanation of claimed limitation and pointed out exact locations in the cited prior art.

Examiner is entitled to give claim limitations their broadest reasonable interpretation in light of the specification. During patent examination, the pending claims must be 'given the broadest reasonable interpretation consistent with the specification.' Applicant always has the opportunity to amend the claims during prosecussion and broad interpretation by the examiner reduces the possibility that the claim, once issued, will be interpreted more broadly than is justified. In re Prater, 162 USPQ 541,550-51 (CCPA 1969).

Reference is made to MPEP 2144.01 - Implicit Disclosure

"[I]n considering the disclosure of a reference, it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom." In re Preda, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968)

Subsequent to an analysis of the claims it was revealed that a number of limitations recited in the claims belong in the prior art and thus encompassed and/or implicitly disclosed in the reference (s) applied and cited. It is logical for the examiner to focus on the limitations that are "crux of the invention" and not involve a lot of energy and time for the things that are not central to the invention, but peripheral. The examiner is aware of the duties to address each and every element of claims, however, it is also important that a person prosecuting a patent application before the Office or an stakeholders of patent granting process make effort to understand the level of one of ordinary skill in the (data processing) art or the level one of skilled in the (data processing) art, as encompassed by the applied and cited references. The administrative convenience derived from such a cooperation between the attorneys and examiners benefits the Office as well the patentee.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Grimsrud teaches a model is employed to represent a sequence of accesses against **the current disk block allocation**, and a number of model pruning criteria is employed to prune the model to derive the improved alternate disk block allocation. As illustrated, at step 252, reallocation optimizer 40 reads the disk location accessed, and constructs a model for the disk locations accessed. For the illustrated embodiment, where **the unit of allocation of the file subsystem** is a file cluster, reallocation optimizer 40 creates a node in the model to represent each file cluster accessed. Additionally, reallocation optimizer 40 creates a transition arc to connect two nodes to represent a successive access relationship between the clusters represented. **A weight is assigned to each transition arc to represent the probability of the transition being made.** The weight (probability) is computed based on the number of occurrences of the transition observed, relative to other transitions from the node. For example, if 6 and 4 transitions from node A to nodes B and C respectively are observed, the transition arc joining nodes A and B is assigned with the weight or probability of 0.6, whereas the transition arc joining nodes A and C is assigned with the weight or probability of 0.4. Other weighting approaches may be employed. Any one of a number of data structures known for storing Markovian chains may be employed to store the node and the transition arc data. **The reallocation optimizer assigns a node to represent each file cluster accessed, a transition arc joining two assigned nodes to represent a successive access relationship between the two represented file clusters, and a weight to each transition arc.**

In response to applicant's argument that there is no suggestion to combine the references (Smith does not overcome the deficiencies of Grimsrud), the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, it would have been obvious to a person of ordinary skill in the art at the time of the invention was made to combine the teaching of Grimsrud with the teaching of Smith to optimize global cache efficiency by using weighting factor. Each priority class is assigned a weighting factor. The greater the relative weight compared to other classes, the greater the priority class performance relative to the respective hit rate slope. These weighting factors provide an additional partition space allocation bias such that a higher priority partition is assured of operating above the knee of the hit rate curve while a lower priority partition may operate at or below the knee of its curve (column 3, lines 42 – 53; Smith).

In view of the above, the examiner contends that all limitations as recited in the claims have been addressed in this Action.

For the above reasons, Examiner believed that rejection of the last Office action was proper.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1 – 12, 17 – 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Number 6,253,296 issued to Knut Grimsrud et al. ("Grimsrud") and in view of U.S. Patent Number 5,394,531 issued to Kevin Smith ("Smith").

With respect to claim 1, Grimsrud teaches a method of managing the allocation of space on storage devices of a computing environment (abstract), comprising:

obtaining one or more weights for one or more storage devices of said computing environment (column 9, lines 16 – 32); and

allocating space on at least one storage device of said one or more storage devices, wherein said allocating is performed by a plurality of file systems of said computing environment (column 11, lines 43 – 57 and line 66 – column 12, line 3).

Grimsrud does not explicitly teach storage device in proportion to at least one weight obtained as claimed.

Smith discloses claimed storage device in proportion to at least one weight (column 8, lines 1 – 6, 16 – 19; Smith).

It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to combine the teaching of Grimsrud with the teaching of Smith to optimize global cache efficiency by using weighting factor. Each priority class is assigned a weighting factor. The greater the relative weight compared to other classes, the greater the priority class performance relative to the respective hit rate slope. These weighting factors provide an additional partition space allocation bias such that a higher priority partition is assured of operating above the knee of the hit rate curve while a lower priority partition may operate at or below the knee of its curve (column 3, lines 42 – 53; Smith).

As to claims 2 and 3, each of said plurality of file systems is located on a separate node and plurality of file systems are located on one or more nodes of said computing environment (column 9, lines 23 – 28; Grimsrud).

As to claim 4, said allocating comprises executing an allocation technique by each file system of said plurality of file systems, wherein at least one file system of said

plurality of file systems is running a different allocation technique than at least one other file system of said plurality of file systems (column 4, lines 5 – 21; Grimsrud).

As to claim 5, each storage device of said at least one storage device is partitioned into a plurality of partitions, and wherein one or more partitions of each storage device are owned by one or more file systems of said plurality of file systems (column 3, lines 1 – 8; Smith).

As to claim 6, allocating space on a plurality of storage devices by a plurality of file systems, wherein each file system of said plurality of file systems allocates space on one or more storage devices of said plurality of storage devices (column 1, line 58 – 65; Grimsrud).

As to claim 7, using at least an allocation manager to obtain said one or more weights (column 3, lines 65 – 68; Smith).

As to claim 8, using said allocation manager and at least one node of said computing environment to obtain said one or more weights (column 3, lines 65 – 68; Smith and column 9, lines 28 – 30; Grimsrud).

As to claim 9, one or more weights represent at least one parameter of said computing environment (column 9, lines 28 – 30; Grimsrud).

As to claim 10, allocating is independent of the obtaining of said one or more weights, wherein the allocating need not have knowledge of at least one of what the weights represent and how the weights were obtained (column 9, lines 25 – 32; Grimsrud).

As to claim 11, at least one storage device of said one or more storage devices has one or more different characteristics than at least one other storage device of said one or more storage devices (column 1, lines 15 – 26; Smith).

As to claim 12, propagating the at least one weight to at least one file system of said plurality of file systems (column 9, lines 24 – 30; Grimsrud).

As to claim 17, informing said plurality of file systems of changes in said at least one weight, wherein said changes are usable in allocating space (column 3, line 65 – column 4, line 10; Smith).

As to claim 18, adjusting at least one weight of said one or more weights, in response to a failure of a file system of said computing environment (column 8, lines 1 – 25; Smith).

As to claim 19, adjusting comprises at least one of: using information provided by at least one other file system of said computing environment to adjust said at least one weight; and using information obtained from reading at least one storage device associated with said at least one weight to adjust said at least one weight (column 8, lines 1 – 25; Smith).

As to claim 20, maintaining at least one weight of said one or more weights, in response to a failure of a file system of said computing environment (column 9, lines 24 – 52; Grimsrud).

As to claim 21, one file system of said plurality of file systems allocates space on said at least one storage device for a given file, and wherein said allocating for that

given file is based on an allocation policy that uses said at least one weight (column 3, line 40 – column 4, line 10; Smith).

As to claim 22, said one file system allocates space on one or more storage devices for another file, and wherein the allocating for that another file is based on another allocation policy that uses one or more weights associated with the one or more storage devices (column 3, line 40 – column 4, line 10; Smith).

The subject matter of claims 23, 46, 47 and 71 are rejected in the analysis above in claims 1 – 12 and 17 – 22 and these claims are rejected on that basis.

Claims 24 – 35 and 40 – 45 are essentially the same as claims 1 – 12 and 17 – 22 except that it set forth the claimed invention as a system rather than a method and rejected for the same reasons as applied hereinabove.

Claims 49 – 60 and 65 – 70 are essentially the same as claims 1 – 12 and 17 – 22 except that it set forth the claimed invention as a program product rather than a method and rejected for the same reasons as applied hereinabove.

Allowable Subject Matter

3. Claims 13 – 16, 36 – 39 and 61 – 64 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art of record does not teach or fairly suggests in combination of steps as recited in claims 13, 36 and 61, wherein combination of steps includes:

tracking changes associated with at least one weight of said one or more weights;

adjusting said at least one weight based on the tracked changes; and

propagating the at least one adjusted weight to a file system of said computing environment, wherein said at least one adjusted weight is usable in allocating space on at least one storage device.

Claims 14 – 16, 37 – 39 and 62 – 64 further limit the subject matter and for the dependency these claims could be allowable.

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shahid Al Alam whose telephone number is (703) 305-2358. The examiner can normally be reached on Monday-Thursday 8:00 A.M. - 4:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim Y Vu can be reached on (703) 305-4393. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-7239 for regular communications and (703) 746-7238 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Shahid Al Alam
Primary Examiner
Art Unit 2172

SAA
August 11, 2003